

### REMARKS

This responds to the Office Action mailed on September 25, 2006, and the references cited therewith.

Claims 15 is amended, no claims are canceled or added in this response; as a result, claims 1-16, 18-47 and 49-63 remain pending in this application. Claim 15 has been amended to correct a minor typographical error, the amendment is not in response to an art based rejection.

#### §103 Rejection of the Claims

Claims 1-3, 5-12, 15, 18, 20, 24-34, 36-43, 46, 49, 51, 55-57, 59, 62, and 63 were rejected under 35 U.S.C. § 103(a) over Chantzis et al. (U.S. Patent No. 6,417,435) in view of Ludwig (U.S. Published Patent Application No. 2004/0069128). In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991)). Applicant respectfully traverses the rejection because the claim contain elements not found in the combination of Chantzis and Ludwig, and because there is no motivation to combine the references.

An example of a claim element not found in the combination of Chantzis and Ludwig occurs in independent claim 1, which recites "weighting at least a subset of the features" and further recites "comparing according to the weighting the extracted features to a dataset of saved note features to determine a matching note." Claims 24, 32 and 55 recite similar language. The Office Action correctly notes that Chantzis does not teach the use of weighting note features. However, the Office Action attempts to make up for the deficiency in Chantzis by stating the Ludwig, at paragraph 644 teaches the recited language. The Office Action further states that Ludwig "shows that weighting of a Fourier component enhances audio signature characteristics

for either analysis or reproduction" (emphasis added). Applicant respectfully disagrees with this interpretation of Ludwig with respect to analysis for several reasons. First, contrary to the statement in the Office Action, nowhere does Ludwig state that input signal features are weighted for analysis purposes. Second, it is clear from the cited section and from Ludwig as a whole, the weighting is performed to create an output signal, not to aid in analysis of extracted features of input data. For example, Ludwig states:

different weighted sums can be used to control the amplitude of a synthesized signal (say a uniform averaging, or sum-of squares averaging) than would be used to control the cut-off frequency of a subtractive filter (here, weighting the higher modes of vibration more strongly would make the synthesis mimic the vibrating element's harmonic balance; weighting the lower more strongly would make the synthesis complement the vibrating element's harmonic balance, etc.).  
(See Ludwig at paragraph 644, emphasis added).

It is clear from the cited sections use of the term "synthesis" and from the opening sentence of paragraph 644 (e.g. "creating yet other derived control signals") that an output signal is being synthesized. Weighting aspects such as amplitude to create a desired effect is totally different from the weighting used in Applicant's claims to aid in determining a match on an input signal.

Further, neither Chantzis nor Ludwig teach or suggest "comparing according to the weighting the extracted features to a dataset of saved note features" (emphasis added).

For the reasons discussed above, neither Chantzis nor Ludwig teach or suggest each and every feature of Applicant's claims 1, 24, 32 and 55. Therefore the combination of Chantzis and Ludwig does not anticipate Applicant's claims 1, 24, 32 and 55. Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 1, 24, 32 and 55.

Claims 2-3 and 5-12 depend either directly or indirectly from claim 1. Claims 25-31 depend either directly or indirectly from claim 24. Claims 33-34 and 36-43 depend either directly or indirectly from claim 32. Claims 56-57, 59, 62, and 63 depend either directly or indirectly from claim 55. These dependent claims inherit the elements of their respective base claims, and are therefore patentable over Chantzis and Ludwig for the reasons argued above, and are also patentable in view of the additional elements which they provide to the patentable combination. If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is also nonobvious. MPEP § 2143.03. Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 2-3, 5-12, 25-31, 33-34, 36-43, 56-

57, 59, 62 and 63.

A further example of an element not found in the combination of Chantzis and Ludwig is found in claim 15, which recites “training a system to recognize a set of notes played by a musical instrument from one or more reference notes.” Claim 46 recites similar language. As detailed in the specification at page 12, line 27 to page 13, line 19, training comprises displaying reference notes and receiving data as a result of the instrument playing the reference note. The data for the reference note, as played by the instrument, can then be used to compare to a later playing of the note or sequence of notes by the same type of instrument. Using training data produced by the instrument itself as recited in Applicant’s claims 15 and 46 is not found in Chantzis. As discussed at column 7, lines 49-59, the data used for comparison in Chantzis is “standardized information stored in RAM 20, reflecting the frequencies and amplitudes that result from a performance that is perfect with respect to pitch and rhythm.” Applicant has reviewed Chantzis, and can find no teaching that this data is the result of playing a particular musical instrument as recited in Applicant’s claims 15 and 46. The system of Applicant’s claims has the benefit that notes from the actual type of instrument being played may be used for comparison, rather than “standardized information” as in Chantzis. As a result, Chantzis does not teach or suggest each and every claim limitation of claims 15 and 46. Further, Applicant has reviewed Ludwig and can find no teaching or suggestion of the recited language. As a result, the claims are not obvious in view of the combination of Chantzis and Ludwig. Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 15 and 46.

Claims 18 and 20 depend either directly or indirectly from claim 15. Claims 49 and 51 depend either directly or indirectly from claim 46. These dependent claims inherit the elements of their respective base claims 15 and 46 and add further patentable distinctions. These dependent claims are therefore not anticipated for the same reasons as discussed above with respect to their base claims. Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 18, 20, 49 and 51.

Additionally, there is no motivation to combine the references, and no proper motivation to combine the references has been provided in the Office Action. The Office Action states that the motivation to combine Chantzis and Ludwig may be found at paragraph 644 of Ludwig, and

further states that “weighting harmonics (or frequency locations and peaks) provides a more accurate (or desirable) representation of a musical note (to be analyzed or reproduced).” While the weighting may provide a more desirable representation of an output note, as discussed above, there is no support in Ludwig for using weighting to enhance the accuracy of analysis of an input note. Producing desirable (and subjective) qualities of an output note have nothing to do with accurate analysis of an input note, and Ludwig does not support in any way analysis of input notes.

Similarly, Chantzis and Ludwig are directed to solving different problems. In Chantzis, the problem is analyzing input data to recognize if a note has been played properly. Ludwig is directed to generating control signals for output by musical devices. Because Chantzis and Ludwig are directed to solving entirely different problems, there is no motivation to combine Chantzis and Ludwig.

Claims 4, 13, 14, 35, 44, and 45 were rejected under 35 U.S.C. § 103(a) over Chantzis et al. (U.S. Patent No. 6,417,435) in view of Kuhn (“A Real-Time Pitch Recognition Algorithm for Music Applications”, Computer Music Journal, 14 (1990) 60-71). Applicant notes that Ludwig was not used in the rejection.

Claims 4, 13, 14 depend either directly or indirectly from claim 1 and claims 35, 44 and 45 depend either directly or indirectly from claim 32. Each of these dependent claims thus inherit elements of their respective base claims directed to weighting at least a subset of note features. As discussed above, Chantzis (and Ludwig) does not teach or suggest weighting note features. Additionally, Applicant has reviewed Kuhn and can find no teaching or disclosure of weighting note features. As a result, neither Chantzis nor Kuhn teach or disclose each and every element of claims 4, 13, 14, 35, 44 and 45, as inherited from their respective base claims.

Further, claims 13, 14, 44, and 45 recite the use of a sum of the square of the amplitude and a sum of the absolute amplitude to determine a start point. In responding to Applicant’s arguments in the previous filed response, the Office Action states “the Applicant has not provided any advantage to the use of a sum of squares of the amplitude (or sum of absolute amplitude). In other words, both the Applicant and Chantzis provide the same result.” Applicant notes that providing the same result is not the test for obviousness, rather it is the elements used to provide the result that are to be tested. Further, there is no basis in the law and regulations

related to related to patentability or in the MPEP that the Applicant state an advantage for using a particular element. All that is required is that the claim be “new, useful and nonobvious” and that the specification enable the use of the element. The Office Action fails to point to any particular element of Chantzis or Kuhn that corresponds to the elements of Applicant’s claims 13, 14, 44, and 45. As a result, the combination of Chantzis and Kuhn fails to teach or suggest each and every element of Applicant’s claims 13, 14, 44 and 45.

For the above reasons, Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 4, 13, 14, 35, 44, and 45.

Claims 9 and 40 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chantzis et al. (U.S. Patent No. 6,417,435) in view of Hall (U.S. Patent No. 6,725,108). Applicant notes that Ludwig was not used in the rejection. Claims 9 and 40 depend either directly or indirectly from claims 1 and 32 respectively. Each of these dependent claims thus inherit elements related to weighting note features. As discussed above, neither Chantzis nor Ludwig teach or suggest weighting features in input note data. Further, Applicant has reviewed Hall and can find no teaching or disclosure of matching based on a subset of weighted note features. As a result, neither Chantzis nor Hall teach or suggest each and every element of claims 9 and 40 as inherited from claims 1 and 32 respectively. Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 9 and 40.

Claims 16, 19, 21-23, 47, 50, 52-54, 58, 60, and 61 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chantzis et al. (U.S. Patent No. 6,417,435) in view of Taruguchi et al. (U.S. Patent No. 6,380,474).

Claims 16, 19 and 21-23, depend from claim 15. Claims 47, 50 and 52-54, depend from claim 46. Each of these dependent claims inherit the elements of their respective base claims, including elements directed to “training a system to recognize a set of notes played by a musical instrument form one or more reference notes.” As discussed above, Chantzis does not teach or disclose training a system to recognize notes. Additionally, Applicant has reviewed Taruguchi, and can find no teaching or suggestion of training a system to recognize notes using a training database. As a result, neither Chantzis nor Taruguchi teach or disclose each and every element of claims 16, 19, 21-23, 47, 50 and 52-54.

Claims 58, 60, and 61 depend from claim 55. Each of these dependent claims thus inherit from claim 55 the recitation of “applying a weighting to at least a subset of a set of note features in the set of data and performing a comparison of the weighted set of note features...” Applicant notes that Ludwig was not used in the rejection. As discussed above and as admitted by the Office Action, Chantzis does not teach or disclose weighting note features. Further, Applicant has reviewed Taruguchi and can find no teaching or disclosure of the recited language. As a result, neither Chantzis nor Taraguchi teach or disclose each and every element of claims 58, 60 and 61.

For the reasons discussed above, neither Chantzis nor Taruguchi, alone or in combination, teach or suggest each and every elements of claims 16, 17, 19, 21-23, 47, 48, 50, 52-54, 58, 60, and 61. As a result, the claims are not obvious in view of the combination of Chantzis and Taruguchi. Applicant respectfully requests reconsideration and the withdrawal of the rejection of claims 16, 17, 19, 21-23, 47, 48, 50, 52-54, 58, 60, and 61.

### **Reservation of Rights**

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant’s silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, all inherency assertions, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind a cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of a cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

**CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6954 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date February 26, 2007

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**CERTIFICATE UNDER 37 CFR 1.8:** The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 26th day of February 2007.

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